GL01646

MOTHER EARTH INDUSTRIES INC.

COMPLETION REPORT

WELL 34-30

LEASEHOLDER

MOTHER EARTH INDUSTRIES

CAREFREE, ARIZONA

PREPARED BY

HIGGINSON-BARNETT, CONSULTANTS

AUGUST, 1985

WELL COMPLETION REPORT

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I. ABSTRACT

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Mother Earth Industries of Carefree, Arizona acquired the majority of the federal leases in the Cove Fort-Sulphurdale Known Geothermal Resource Area (KGRA), from Union Oil Company. Union Oil Company had drilled four wells and concluded that they were no longer interested in proceeding with development of the property. Mother Earth Industries, succeeding Union Oil, determined they would proceed to explore for geothermal resources beyond the exploration that had been accomplished by Union Oil.

In the fall of 1983, and MEI affiliate, Cove Creek Geothermal, drilled Well #34-7. At a depth of about 1,100 feet the well bore encountered dry steam, which was not anticipated, and Well #34-7 became an uncontrolled blow-out well. After considerable effort Cove Creek Geothermal successfully closed the discovery well and proceeded to move a few 100 feet to the northeast and drill Well #34-7B. #34-7B was successfully completed and it verified the existence of quality steam on the property. With that verification MEI moved back to the well pad constructed for the drilling of Well #34-7 and at a location slightly to the south of the initial location, drilled Well #34-7A.

In May of 1985 Mother Earth Industries moved away from the discovery wells and drilled Wells #34-30, #66-28, and #47-6. Each of these wells was drilled to test a bona fide geothermal objective and to preserve the federal leases on which they were situated as provided in Bureau of Land Management Instruction Memorandum No. 85-63, dated October 23, 1984. Drilling, in each isntance, was commenced before the termination of the primary tern of the affected lease and continued over the end of the primary term. These wells were completed in June and July of 1985. This report is specific to the drilling of Well #34-30 which was commenced May 21, 1985 and completed to a total depth of 2487' on June 6, 1985.

This report is prepared as required by federal regulations as a well completion report and is submitted to the Bureau of Land Management. The material in the report was obtained from a number of sources and was correlated and summarized by Higginson-Barnett, Consultants, a consulting firm in Bountiful, Utah. Higginson-Barnett participated in the activities associated with the drilling of the well, particularly as they related to geology and permitting. ThermaSource Inc. of Santa Rosa, California, particularly Mr. Louis Capuano, designed the well and supervised it's construction. The well location was determined by Forsgren-Perkins, a consulting engineering firm in Salt Lake City, Utah. The information provided herein, is by the approval of Wayne A. Portanova, President of Mother Earth Industries.

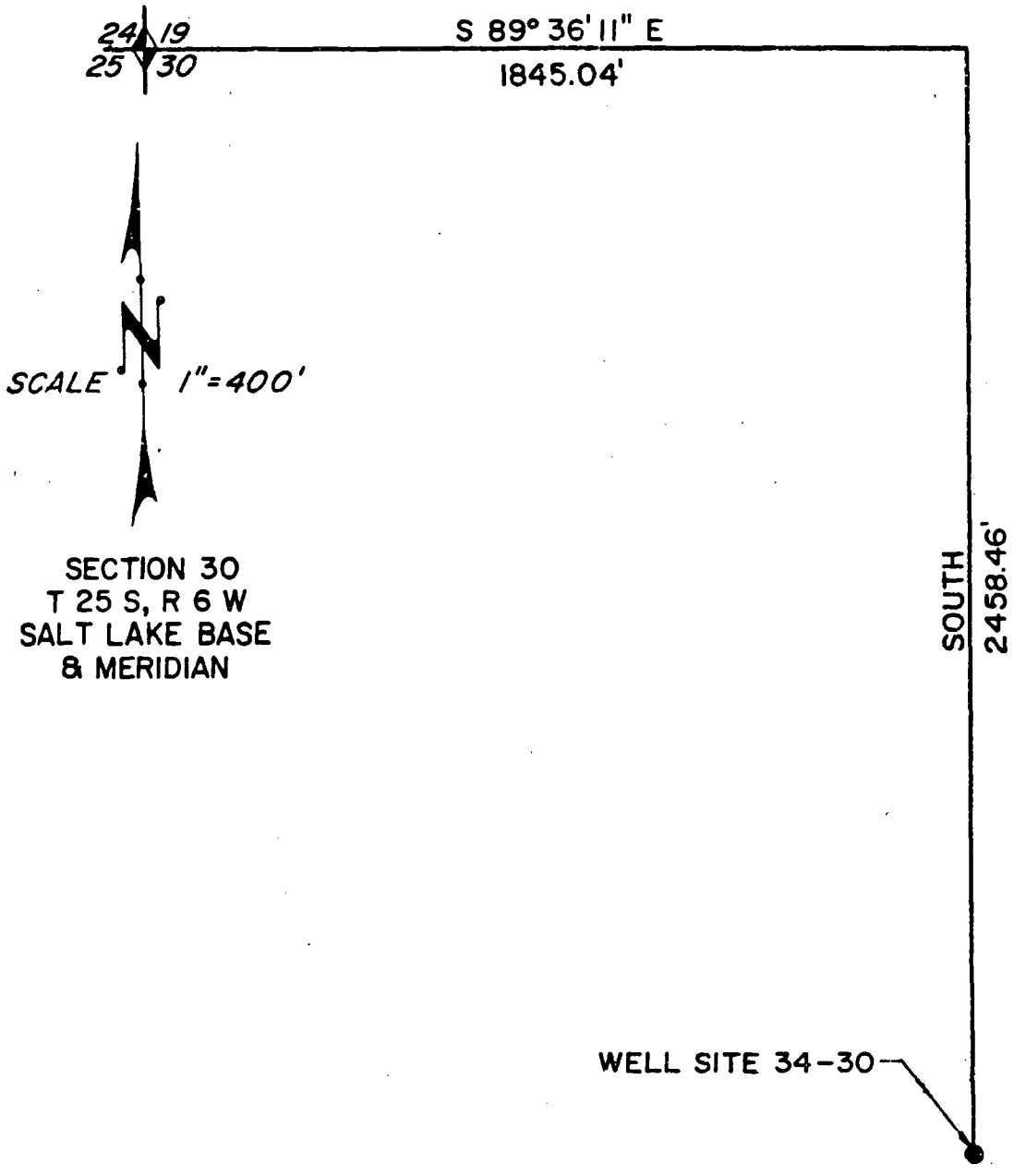
II. LOCATION

II. LOCATION

This report covers the completion of Mother Earth Industries' Well #34-30. The well is located in Millard County, Utah near Cove Fort in the Cove Fort-Sulphurdale KGRA. More specifically the well is described as: Beginning from the Northwest Corner of Section 30, T25S, R6W, SLB&M, thence S89°36'11"E 1845.04' and So. 2458.56' to Well #34-30.

Figure #1 shows the location of Well #34-30.

FIGURE #1



REVISED	DATE

FORSGREN-PERKINS ENGINEERING, p.e.

MOTHER EARTH INDUSTRIES
WELL SITE 34-30

DRAWN
FOR:
BY: FSH
DATE: MAY 1985
SCALE: As NOTED
DRAWING NO.

III. WELL DRILLING AND CONSTRUCTION HISTORY

III. WELL DRILLING AND CONSTRUCTION HISTORY

Drilling of Mother Earth Industries' Well #34-30 began on May 21, 1985 with the drilling of a 26" hole to the depth of 20' and then cementing in 20" conductor. The drilling of the 26" hole was done with a Earth Drill Model #52. With the conductor set, the Earth Drill was changed out and drilling was continued using a Wilson Truck Mounted Rotary Rig.

The new rig spudded in on June 3, 1985, and the hole was then drilled with mud to a depth of 123' where 13-3/8" casing was cemented in a 17-1/2" hole. A blow-out prevention stack was also installed and tested on the 13-3/8 casing. Drilling continued with a 12-1/4" bit to a depth of 572' where 9-5/8" casing was cemented in. Here again the well was equiped with blow-out prevention equipment.

An 8-3/4" hole was then drilled with air to a total depth of 2488'. While drilling, the hole began to make water at 29 barrels per hour at 1231'. At 1355' it was making 35 barrels per hour and at 1446' it was making 85 barrels per hour. By 1717' the hole was making 170 barrels and by 2450' it was making about 325 barrels of water per hour. The well was completed on June 16, 1985.

Figure #2 is a daily journal of the activities associated with the drilling of Well #34-30. Figure #3 shows a graph of time spent in drilling the well. Figure #4 is a profile of the well. Records of drilling mud, air drilling, and drill bits are shown in Figures #5, #6, and #7. Occasionally the driller took a survey of the hole. The results are shown in Figure #8. Figure #9 gives the specifications of the Wilson Truck Mounted Rotary Rig which drilled the majority of the hole.

ThermaSource Inc.
P.O. Box 1236 • Santa Rosa, CA 95402

*Each Day from 7:00 AM to 7:00 AM

FIGURE #2

WELL NAME: Cove Fort #34-30 LOCATION: Cove Fort, Utah

OPERATOR: Mother Earth Industries PREPARED BY: Louis Capuano

DATE	DEPTH	OPERATIONS
6/4/85	125'	Spud at 7:00 AM, 6/3/85 with H & W Rig #7. Drill rat hole then drill 12-1/4" hole with dyna-drill from 30' to 125'. Pull out of hole. Lay down dyna drill and make up 17-1/2" bottom hole assembly. Run in hole and open 12-1/4" hole to 17-1/2" from 30' to 125'. Circulate and clean hole. Pull out of hole. Rig up to run 13-3/8" casing, ran 3 joints (123') of 13-3/8", 54.50 ppf, K-55, buttress casing with B&W stab in float shoe. Set shoe at 122' depth with 166 cuft of Class "G" cement blended with 40% silica flour and 3% CaCl2. Cement in place at 11:30 PM. Wait on cement 7 hours.
6/5/85	172'	Wait on cement one hour. Cut off 20" of 13-3/8" casing. Weld on casing head. Install 12" X 900 blow out preventer. Test complete shut off to 200 psi. Okay. Lay down 17-1/2" tools. Run in hole with 12-1/4" bit to top of cement at 110'. Drill out cement, shoe. Drill open hole to 141'. Survey. Drill to 172'. Pull out of hole and pick up bottom hole assembly.
6/6/85	523'	Pick up 8" drill collars with 12-1/4" bit. Drill to 280'. Wipe hole. Survey. Drill to 398'. Survey. Drill to 438'. Wipe hole. Work on mud pump. Drill to 523'.
6/7/85	572'	Drill to 572'. Wipe hole, circulate and condition hole from casing. Pull out of hole. Lay down 12-1/4" tools. Change blow out preventer rams and blow out preventer. Pick up casing tongs. Run 14 joints (570') of 9-5/8", K-55 & N-80, 36# & 40#, buttress casing. Circulate last 2 joints down. Shoe at 569'. Stab in float collar at 528'. Centralizers on bottom joint, then every other collar. Circulate casing and rig down casing tongs. Run in hole with 4-1/2" drill pipe. Stab in at 528'. Circulate casing and cool hole. Mix and pump as follows: Pump 20 barrels water followed by 200 cu.ft. (94 sacks) Class "G" cement, blended with 1:1 perlite, 40% silica flour, 3% gel, 0.5% CFR-2, followed with tail of 176 cu.ft. (109 sacks) Class "G" cement blended with 40%

WELL NAME: Cove Fort #34-30 LOCATION: Cove Fort, Utah

OPERATOR: Mother Earth Industries PREPARED BY: Louis Capuano

DATE	DEPTH	OPERATIONS
		silica flour, 0.5% CFR-2, 2% CaCl2. Good returns to surface. Displaced drill pipe with 7.5 barrels water. Cement in place at 2:30 AM. Pull out of hole. Wait on cement. After 1-1/2 hours did top job. Annulus of 13-3/8" X 9-5/8" standing full.
6/8/85	572'	Wait on cement. Remove blow out preventer equipment. Cut off 13-3/8" casing. Cut off 9-5/8" casing. Prepare blow out preventer stack. Install casinghead. Install blow out preventer equipment, blooie line and bleed off manifold, wing valves. Fill up line, prepare rig floor for drilling.
6/9/85	632'	Test complete shut off at 800 psi for 15 minutes. Test good. (Witness W. Wagstaff - State of Utah) Hold H2S meeting. Run in hole with 8" drill collars and drill pipe. Test 4-1/2" pipe rams at 800 psi for 15 minutes. Okay. Lay down 8" drill collars. Pick up 6-1/4" drill collars. Run in hole with 8-3/4" bit to top of cement at 525'. Make up rotating head rubber. Drill out cement, float collar. Cement to shoe and shoe. Drill 5' formation. Blow well dry with air. Hook up water to blooie line. Drill to 632'. Circulate and survey. Pull out of hole. Hold H2S meeting. Run in hole to 580'. Ream to 632'.
6/10/85	1105'	Drill to 734'. Pull to 9-5/8" casing shoe. Run in hole and drill to 856'. Survey at 814'. Drill to 947'. Wipe hole to shoe. Run in hole. Drill to 1010'. Circulate and survey at 980'. Drill to 1105'.
6/11/85	1477'	Drill to 1137'. Blow hole dry. Pull out of hole. Run in hole. Drill to 1416'. Survey at 13867. Drill to 1477'; hole making water: 29 barrels per hour at 1231' 35 barrels per hour at 1355' 85 barrels per hour at 1446'
6/12/85	1634'	Drill to 1634'. Circulate and blow. Survey at 1603'. Pull out of hole. Lay down stab. Change bit and rot rubbers. Repair rig. Run in hole to shoe. Repair rig.

ThermaSource Inc.
P.O. Box 1236 • Santa Rosa, CA 95402

WELL NAME: Cove Fort #34-30 LOCATION: Cove Fort, Utah

OPERATOR: Mother Earth Industries PREPARED BY: Louis Capuano

DATE	DEPTH	OPERATIONS
6/13/85	1788'	Repair rig. Tie down blow out preventer equipment. Run in hole and blow at 600' (no water). Run in hole and blow at 1200' (small amount of water). Run in hole and blow at 1600' (2-3 barrels water). Run in hole and drill to 1788'. Possible fluid entry at 1717' (90 barrels per hour). Well now making 170 barrels per hour. 10' fill at 1717' (connection). Slug hole 2 times. Began misting at one gallon per minute. No fill.
6/14/85	2041'	Drill to 1817'. Pull out of hole for new bit. Run in hole and ream from 1795' to 1817'. Drill to 2024'. Survey at 1995'. Drill to 2041'. Pull out of hole. Tight spot at 1861' during connection. Slug hole to clean up.
6/15/85	2290'	Pull out of hole. Change bits. Run in hole and ream from 2021' to 2041'. Drill to 2290'. Hole making approximately 325 barrels per hour.
6/16/85	2460'	Drill to 2302'. Blow hole clean. Pull out of hole. Change bits. Run in hole and ream from 2270' to 2301'. Drill to 2460'; hole making less water at 2391', but 325 barrels per hour at 2450'.
6/17/85	2488'	Drill 8-3/4" hole to 2488'. Blow clean and survey. Pull out of hole and lay down drill pipe and drill collars. Clean pits. Rig down blow out preventer equipment. Released rig at 7:00 PM, 6/16/85 for move to next site.

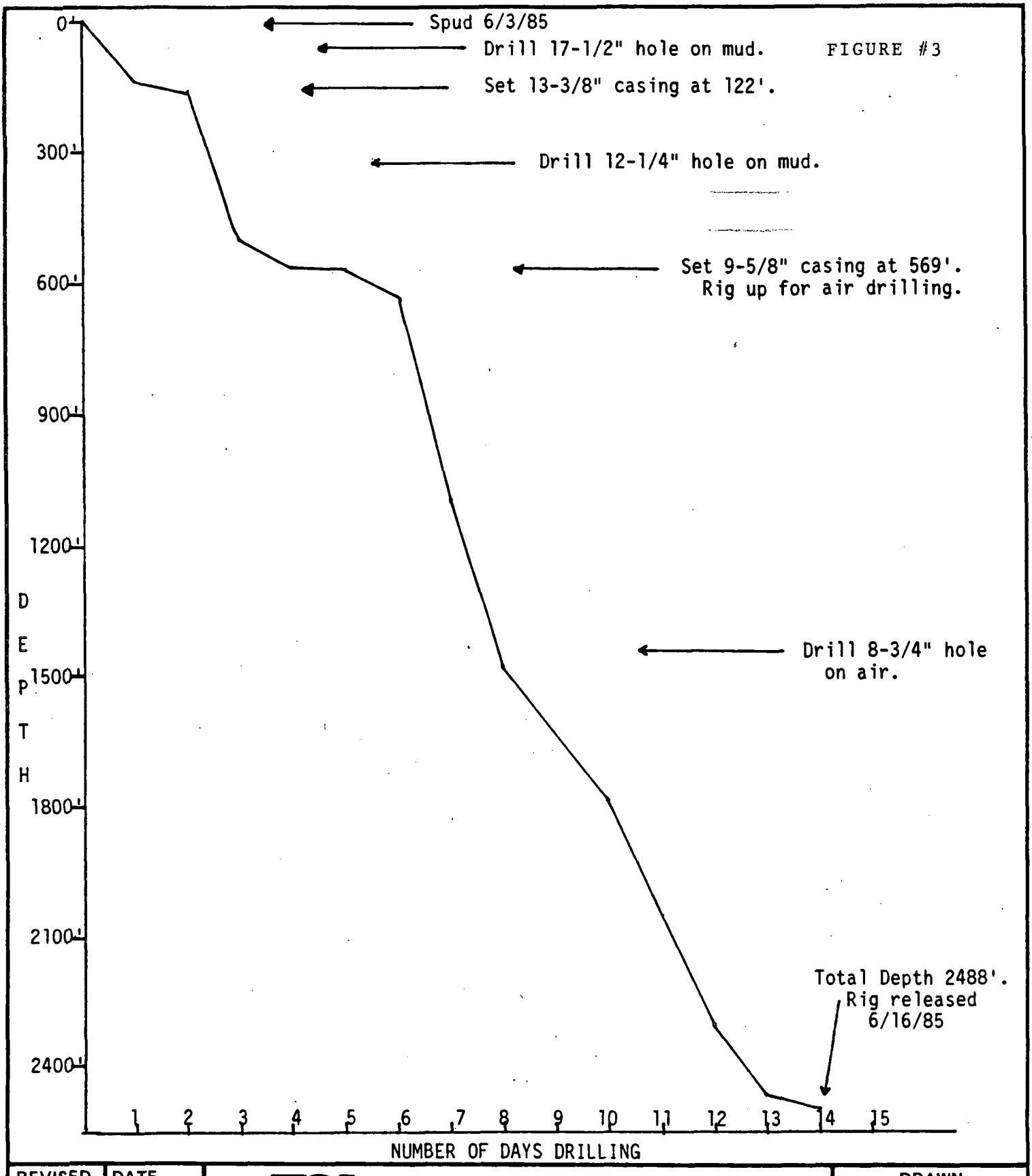


FIGURE #3

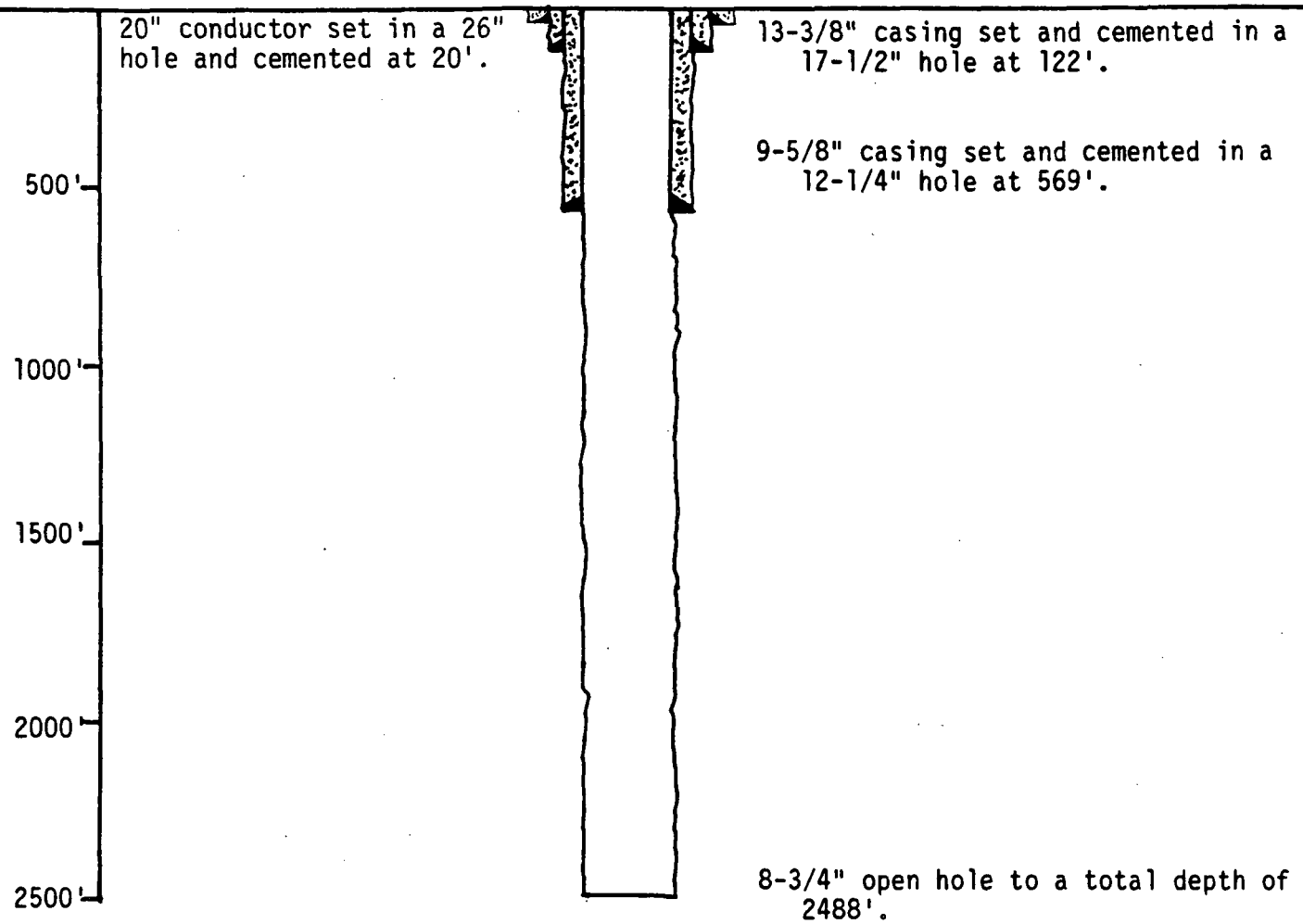
REVISED	DATE

TSi ThermaSource Inc.
• P.O. Box 1236 • Santa Rosa, California 95402
(707) 523-2960 • Telex 171743 • TWX 510 7446439

WELL SCHEMATIC
COVE FORT #34-30
MOTHER EARTH INDUSTRIES

DRAWN
FOR: MEI
BY: LEC
DATE: 8-1-85
SCALE:
DRAWING No.

FIGURE #4



REVISED	DATE		DRAWN
		TSI ThermaSource Inc. • P.O. Box 1236 • Santa Rosa, California 95402 (707) 523-2960 • Telex 171743 • TWX 510 7446439	FOR: MEI
			BY: LEC
		WELL SCHEMATIC COVE FORT #34-30 MOTHER EARTH INDUSTRIES	DATE:
			SCALE:
			DRAWING No.

FIGURE #5

MUD DATA

WELL NAME: Cove Fort #34-30

DATE	DEPTH (meters)	MUD WEIGHT (lbs/ft^3)	MUD VISCOSITY (sec)	STAND PIPE PRESSURE (psig)	TEMPERATURE OUT (°F)	REMARKS
6/4/85	125'	73	48	500		Set 13-3/8" casing at 122'.
6/5/85	172'	78	38	500		
6/6/85	523'	69	39	350		
6/7/85	572'	71	38	400		Set 9-5/8" casing at 569'.
6/8/85						Rig up for air drilling.

THERMASOURCE, INC.

FIGURE #6

AIR CIRCULATING DATA

DATE	DEPTH (FEET)	CIRCULATING MEDIA	COMP. PRESSURE (PSIG)	INPUT VOLUME OR (CFPM)	NO. OF COMP. OR RUNNING	TEMP OUT °F	EXIT PRESSURE (PSIG)	REMARKS
6/9/85	632'	Air	145	1140	1	70°		
6/10/85	1105'	Air	270	1142	1	70°		
6/11/85	1477'	Air	225	1171	1	160°		
6/12/85	1634'	Air	225	1138	1	168°		
6/13/85	1788'	Air	230	1170	1	175°		
6/14/85	2041'	Air	320	1141	1	180°		
6/15/85	2290'	Air	450	1137	1	182°		
6/16/85	2460'	Air	450	1135	1	182°		
6/17/85	2488'	Air	470	1135	1	181°		

BIT RECORD

ThermaSource Inc.
P.O. Box 1236 • Santa Rosa, CA 95402

LEASE AND WELL NUMBER: MEI Cove Fort 34-30

DATE SPUDDED: 6-3-85

DIVISION:

COMPANY DRILLING FOREMEN:

DRILLING CONTRACTOR AND RIG NO.: HEC Drilling Rig #1

BIT No.	SIZE	MAKE	TYPE	NOZZLES 32 NDS			DEPTH OUT	FEET	HOURS	FEET PER HOUR	BIT WT. M LB.	ROT. RPM.	DULL COND. 8 TH T	DULL COND. 8 TH B	DULL COND. 8 TH G & REM	STAND PIPE PRESS.	DEPTH IN	CIRC. MEDIA	DATE IN	DATE OUT	SERIAL No.
1	12¼	HTC	J-4	open			125'	95	3	32	5	100	1	1	I	500	30		6-3	6-3	CF 7855
2	17½	STC	DS	open			125'	95	5	20	10	60	1	1	I	200	30		6-3	6-3	BF 7461
NK 1	12¼	HTC	J-4	16	16	16	173'	49	2	24	10	60	2	2	I	300	125		6-3	6-5	CF 7855
3	12¼	HTC	X44	16	16	16	572'	399	22¼	18	15	105	2	1	I	500	173		6-5	6-6	ZC 7116
4	8¾	HTC	455	open			1137'	565	26	21.7	18	60	2	3	I	200	572		6-7	6-11	CB 11051
5	8¾	STC	467	open			1634'	497	25½	20	16	65	3	5	I	250	1137		6-11	6-12	CB 5132
6	8¾	STC	56H	open			1817'	183	15	12	18	65	5	6	1/16	250	1634		6-12	6-13	CB 10532
7	8¾	STC	46H	open			3041'	224	15¼	15	18	65	4	4	I	300	1817		6-13	6-14	CB 7541
8	8¾	STC	455	open			2301/2488	261	20.5	12.7	18	65	4	5	1/16	300	3041		6-14	6-16-85	CB 11150
9	8¾	HTC	HH44	open			2488	187	18½	9.5	18	65/80	8	8	Y2	480	2301		6-16	6-17-85	CBS 1414

FIGURE #7

-13-

FIGURE #8

DIRECTIONAL INFORMATION

MOTHER EARTH INDUSTRIES

MEI #34-30

DEPTH	DEVIATION
141'	$0^{o}30'$
280'	$0^{o}45'$
398'	$0^{o}30'$
601'	$0^{o}30'$
814'	1^{o}
980'	1^{o}
1386'	$1^{o}45'$
1603'	2^{o}
1995'	$2^{o}30'$
2488'	$3^{o}15'$

Drilling Inc. P.O. Box 1851, El Centro, California 92244 (619) 353-5440

RIG 7

DESCRIPTION

WILSON Mogul 42 Double Drum Drawworks, S/N 10034, 450 HP, LEBUS Grooved for 1" Line, 9/16" Sand Line Drum, Water Circulating Brake, Texas Western 56S Makeup S/N 112 and Spinning Catheads, Hydraulic Breakout Cylinder, Air Drillers Control, Mounting Bracket for Halliburton Measuring Device

WILSON Single Engine Compound

CATERPILLAR 3412 600 HP Diesel Engine, S/N 38S1658 w/Air Starter, Radiator, Gauges, Allison TC955 Torque Converter S/N 63016

QUINCY 325-15 Air Compressor S/N 183914S, Compound Driven

WILSON 102-250 102' Hydraulically Raised and Scoped Mast, 250,000 lb. Static Hook Load, Crown Block w/5 Sheaves, 1" Line, 3½" Standpipe, Crown Safety Platform, Racking Board, Tong Counterweights, Catline Sheave, Ladder, Derrick Climber, Mast Stand (Mounted on Carrier), Flourescent Lights, 5/8" and 3/4" Guy Lines

SUBSTRUCTURE 10'H x 13'W x 21'6"L w/Rotary Beams, 4' Folding Side Mounted Wings, V-Door Ramp, (1) 14' Stair Floor to Ground Parallel w/Ramp on Off Drillers Side, (2) 8'6" Stairs Floor to Unit each side, Safety Rails, Boxes Plated Top and Bottom, Sub Carrier in Base, (Rotary Table Mount Flush w/Floor), Opening for Rat Hole and Mouse Hole

MUD TANK - 3'H x 6'W x 28'L 100 Bble w/2-3' x 4' Single Shale Shakers 3 Cone Desilter

PUMP - Emsco D-500 7½" x 16" Driven by Caterpillar 3412 Engine

WATER TANK - 1500 Gal

GENERATOR - 25 KW Powered by Detroit 371 Diesel Engine

BLOCKS & HOOK - Combination 150 Ton Sowa

SWIVEL - Gray 150 Ton

KELLY - 4½ Square

ROTARY TABLE - Hacker 17½" Opening

TONGS - Woolley Type C

WATER TRUCK - 1977 Chevy 2000 Gal Tank

IV. WELL TEST

IV. WELL TEST

Though it is anticipated that at a future date a flow test might be performed, at the present no such testing has occurred. However a temperature and pressure survey of the well was done after completion of the well. The results indicate that a maximum temperature of 216°F was reached at the bottom of the well, though the gradient suggests that the temperature was only increasing at a slow rate. Pressure increased at a linear rate from the start of the water table at 1170' to total depth.

Figures #10 and #11 show the results of the temperature and pressure logs.

FIGURE #10

PRUETT INDUSTRIES INC
8915 ROSEDALE HWY, BAKERSFIELD, CA. 93308
(805) 589-2768

SUB-SURFACE TEMPERATURE SURVEY

CO.	MOTHER EARTH IND	RUN 01	FIELD COVE FORT	WELL	34-30
EFF DEPTH	2488'	WELL STAT	STATIC	TOOL HUNG	
CASING	9 5/8" TO -569'	CASING PRESS		ON BOTTOM	15:07
LINER	-	TUBING PRESS		OFF BOTTOM	15:12
DATE	071785	ELEMENT RANGE	57 - 490	ZERO POINT	12'
ELEVATION		ZONE		SHUT-IN	
MAX TEMP		PICK-UP	2488'	ON-PROD	
PERF	-	CAL SER NO.	31	MPD	
TUBING	-				
UNITS	ENGLISH	PURPOSE	TEMPERATURE GRADIENT 7/17/85		

SURVEY DATA

CO. MOTHER EARTH IND RUN 01 FIELD COVE FORT WELL 34-30

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
1:00	0	91.2	0.000	1:00	1400	212.9	.060
1:00	100	90.9	-.004	1:00	1450	213.5	.021
1:00	200	91.4	.006	1:00	1500	213.7	-.004
1:00	300	93.7	.082	1:00	1550	213.9	.004
1:00	400	109.5	.098	1:00	1600	213.9	0.000
1:00	500	123.5	.140	1:00	1650	213.9	0.000
1:00	550	130.6	.143	1:00	1700	213.9	0.000
1:00	600	137.4	.136	1:00	1750	214.4	.009
1:00	650	144.2	.134	1:00	1800	214.4	0.000
1:00	700	151.0	.136	1:00	1850	214.6	.004
1:00	750	157.2	.125	1:00	1900	215.0	.009
1:00	800	163.4	.123	1:00	1950	215.0	0.000
1:00	850	166.4	.062	1:00	2000	215.4	.009
1:00	900	171.9	.108	1:00	2050	215.4	0.000
1:00	950	176.4	.092	1:00	2100	215.9	.009
1:00	1000	180.9	.088	1:00	2150	215.9	0.000
1:00	1050	184.7	.076	1:00	2200	215.9	0.000
1:00	1100	189.1	.089	1:00	2250	215.9	0.000
1:00	1150	191.4	.047	1:00	2300	215.9	0.000
1:00	1200	197.9	.128	1:00	2350	215.9	0.000
1:00	1250	203.2	.107	1:00	2400	215.9	0.000
1:00	1300	207.5	.086	1:00	2450	216.1	.004
1:00	1350	209.8	.047	1:00	2488	216.1	0.000

RUN BY S.WILSON/B.DAILY

TEMPERATURE GRADIENT

MOTHER EARTH IND.

COVE FORT

WELL #34-30

7/17/85

file # 010034-3

2488' V

TEMPERATURE F

220.0
200.0
180.0
160.0
140.0
120.0
100.0
80.0

DEPTH(FT)

0.0 200.0 400.0 600.0 800.0 1000.0 1200.0 1400.0 1600.0 1800.0 2000.0 2200.0 2400.0 2600.0

PRUETT INDUSTRIES INC
8915 ROSEDALE HWY. BAKERSFIELD,CA. 93308
(805) 589-2768

FIGURE #11

SUB-SURFACE PRESSURE SURVEY

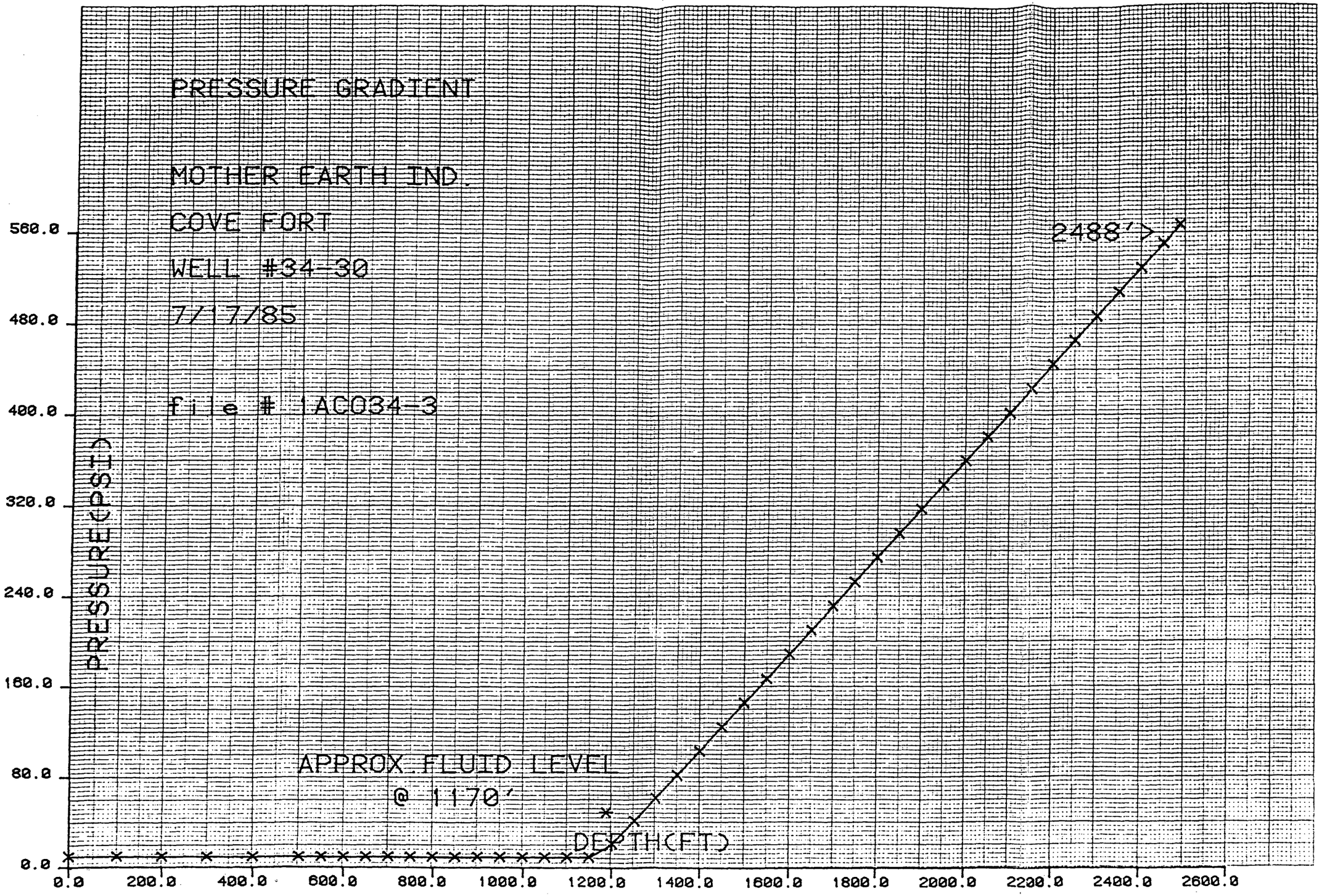
CO. MOTHER EARTH IND		RUN 1A	FIELD COVE FORT	WELL 34-30	
EFF DEPTH 2488'		WELL STAT	STATIC	TOOL HUNG	
CASING 9 5/8" TO -569'		CASING PRESS		ON BOTTOM	15:07
LINER	-	TUBING PRESS		OFF BOTTOM	15:12
DATE	071785	ELEMENT RANGE	0 - 1056	ZERO POINT	12'
ELEVATION		ZONE		SHUT-IN	
MAX TEMP		PICK-UP	2488'	ON-PROD	
PERF	-	CAL SER NO.	15128	MPD	
TUBING	-				
UNITS	ENGLISH	PURPOSE	PRESSURE GRADIENT 7/17/85		

SURVEY DATA

CO. MOTHER EARTH IND — RUN 1A — FIELD COVE FORT — WELL 34-30

TIME	DEPTH	P/T	GRAD	TIME	DEPTH	P/T	GRAD
1:00	0	9.8	0.000	1:00	1400	103.3	.418
1:00	100	9.8	0.000	1:00	1450	124.8	.431
1:00	200	9.8	0.000	1:00	1500	146.4	.432
1:00	300	9.8	0.000	1:00	1550	167.5	.422
1:00	400	9.8	0.000	1:00	1600	189.1	.432
1:00	500	9.8	0.000	1:00	1650	210.7	.432
1:00	550	9.8	0.000	1:00	1700	232.3	.431
1:00	600	9.8	0.000	1:00	1750	253.7	.429
1:00	650	9.8	0.000	1:00	1800	275.1	.428
1:00	700	9.8	0.000	1:00	1850	296.5	.427
1:00	750	9.8	0.000	1:00	1900	317.8	.426
1:00	800	9.8	0.000	1:00	1950	339.0	.425
1:00	850	9.8	0.000	1:00	2000	360.2	.424
1:00	900	9.8	0.000	1:00	2050	381.4	.423
1:00	950	9.8	0.000	1:00	2100	402.5	.422
1:00	1000	9.8	0.000	1:00	2150	423.6	.422
1:00	1050	9.8	0.000	1:00	2200	445.2	.433
1:00	1100	9.8	0.000	1:00	2250	466.3	.422
1:00	1150	9.8	0.000	1:00	2300	487.5	.422
1:00	1200	21.5	.234	1:00	2350	508.6	.423
1:00	1250	41.7	.404	1:00	2400	529.7	.423
1:00	1300	61.6	.399	1:00	2450	550.9	.424
1:00	1350	82.4	.415	1:00	2488	567.3	.432

BY S.WILSON/B.DAILY



V. GEOLOGY

V. GEOLOGY

The lithology of Well #34-30 was determined primarily by examining the drill cuttings under a binocular microscope with added imput coming from the study of geologic reports and maps of the area as well as direct imput from geologists Dr. Myron Best and Tom Steven.

Well #34-30 was drilled in a region which has been identified as a Known Geothermal Resource Area. Three different hydrothermal episodes have been identified by Moore and Samberg (1979)[1] with the last being related to the active deposition of sulphur in the area. These episodes of hydrothermal activity are tied to relatively recent volcanic and seismic activity in the area.

Steven and Morris (1983),[2] map many north to northeast trending basin and range faults in the vicinity of the well. These faults provided the conduits for deposition of pyrite and other basemetal sulfides in historic times as well as sulphur deposition in recent times. Generally these step basin and range faults cause only small amounts of displacement with the exception of a few which have caused the major relief of the area.

Volcanic activity began in the area about 30 m.y. ago and continued up until 0.5 m.y. ago (Steven and Morris, 1983).[2] These volcanics consist of predominately intermediate composition lava flows, tuff breccias, and ash-flow tuffs which were deposited upon deformed Paleozoic and Mesozoic sedimentary rocks. These volcanics have since been faulted and altered.

1) GEOLOGY OF THE COVE FORT-SULPHURDALE KGRA, by J. N. Moore and S. M. Samberg, 1979.

2) GEOLOGIC MAP OF THE COVE FORT QUADRANGLE, WEST-CENTRAL UTAH, by Thomas A. Steven and Hal T. Morris, 1983.

Well #34-30 begins in unconsolidated alluvial fill material made up of both sedimentary and volcanic rocks from the near-by Pavant Range. The alluvial material is approximately 170' thick. From 170' to 290' the Three Creeks Tuff Formation is encountered. This regional formation was derived from a caldera to the east of the site. The Wah Wah Srings Member of the Neeldles Range Formation follows the Three Creeks. This ash-flow tuff, which was derived from a caldera complex near the Utah-Nevada border, continues to about 370' where the Dog Valley volcanics are next encountered.

The Volcanics of Dog Valley are a heterogeneous sequence of intermediate-composition lava flows, tuff breccias, and ash-flow tuffs. This sequence is of local origin and makes up a large amount of the volcanic rocks in the area.

A fault zone is encountered starting at about 520' and continuing to about 570'. This fault zone is marked by pyrite and quartz veining as well as extensive silicification. Immediately following the fault zone Paleozoic sedimentary rocks are found. This sequence continues to the bottom of the hole. These undifferentiated Paleozoic rock consist primarily of dolomites with occasional zones of quartzite, limestone, and siltstone. These rocks are occasionally altered or show mineralization in connection with hydrothermal activity.

The lithologic log of Well #34-30 is shown in Figure #12.

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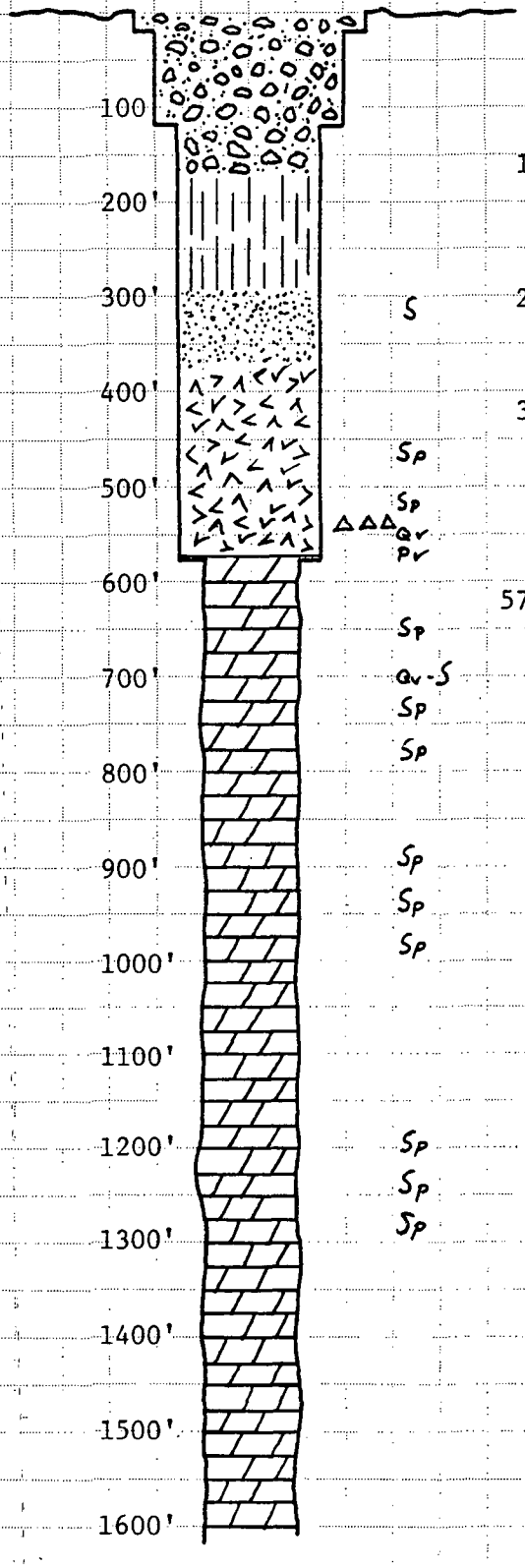
JOB MOTHER EARTH INDUSTRIES' WELL #34-30
SHEET NO. 1 OF 2
CALCULATED BY DAB DATE 9/5/85
CHECKED BY JAB DATE 9/6/85
SCALE 1"=400' (vertical)

FIGURE #12



0'-170' QUATERNARY ALLUVIUM

170'-290' THREE CREEKS TUFF
Densely welded, crystal rich, ash-flow tuff, containing phenocrysts of plagioclase, hornblende, and biotite.

290'-370' NEEDLES RANGE FORMATION
Light grey, medium grained, welded ash-flow tuff. Wah Wah Springs member here present.

370'-570' VOLCANICS OF DOG VALLEY
A heterogenious sequence of intermediate composition lava flows, tuff brecias, and ash-flow tuffs.

570'-2487' UNDIFFERENTIATED PALEOZOIC ROCKS
Undiffernetiated Paleozoic sedimentary rocks consisting predominately of dolomites with occasional beds of limestone, quartzite, and siltstone. Rocks are often speckled with pyrite or show pyrite or quartz veining.

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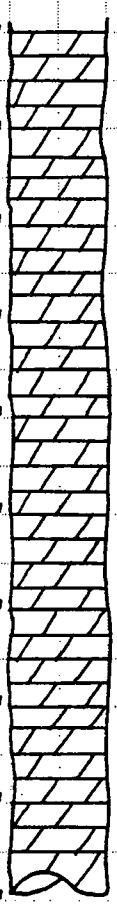
JOB MOTHER EARTH INDUSTRIES' WELL #34-30
SHEET NO. 2 OF 2
CALCULATED BY DAB DATE 9/5/85
CHECKED BY JAB DATE 9/6/85
SCALE 1"=40' (vertical)

LITHOLOGY MINERALIZATION



TD=2487'

Qv

570'-2487' UNDIFFERENTIATED PALEOZOIC ROCKS

Undifferentiated Paleozoic sedimentary rocks consisting predominately of dolomites with occasional beds of limestone, quartzite, and siltstone. Rocks are often speckled with pyrite, or show pyrite or quartz veining.

Qv

MINERALIZATION KEY

S_p - Speckled with pyrite.
P_v - Pyrite veining.
Q_v - Quartz veining.
S - Silicified.
ΔΔΔ - Fault zone.